

METHOD AND SYSTEM FOR REPORTING XML
DATA BASED ON PRECOMPUTED CONTEXT
AND A DOCUMENT OBJECT MODEL

Inventor: Ballantyne, et al.
Express: EL739956652US

014208.1360

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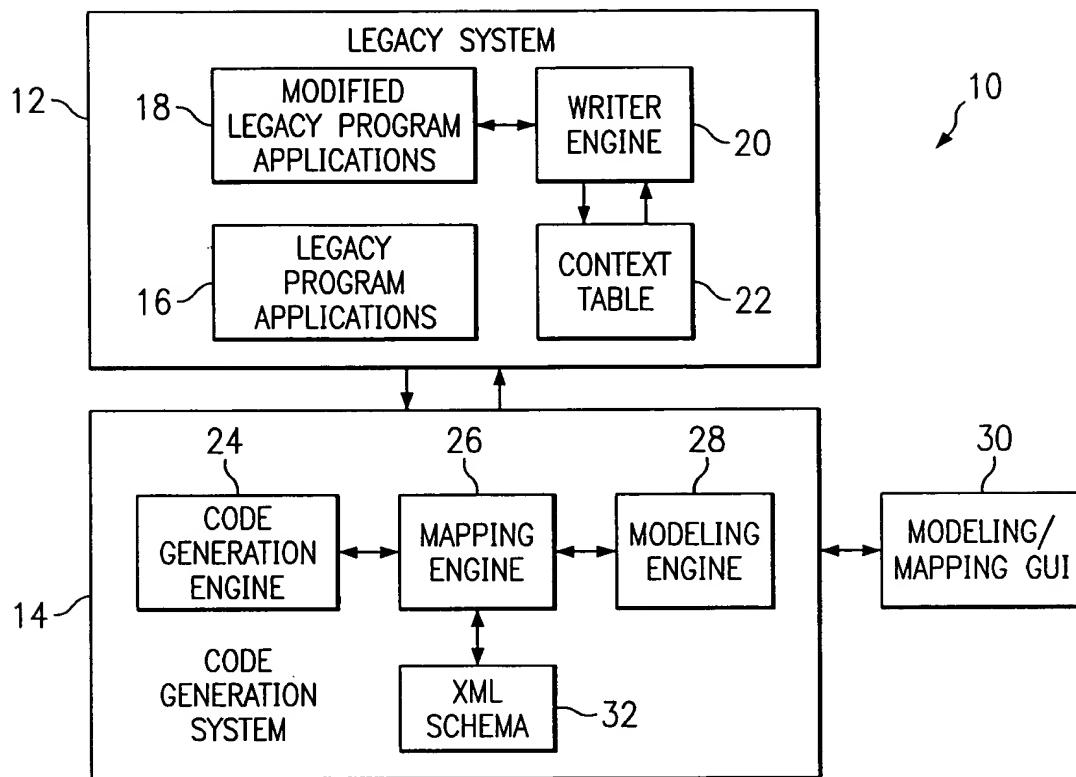


FIG. 1

09202522-07202522

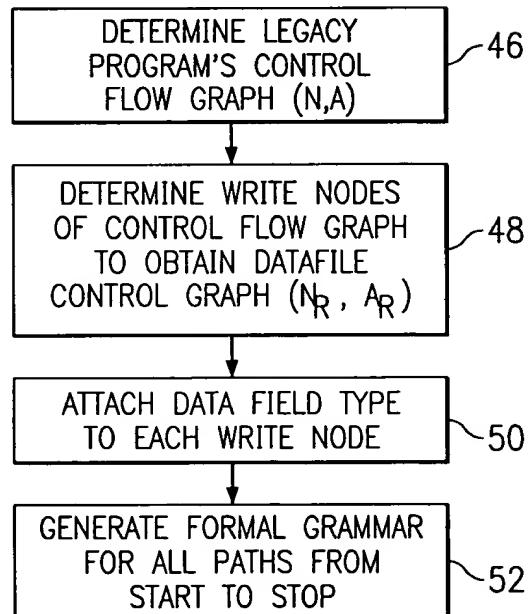
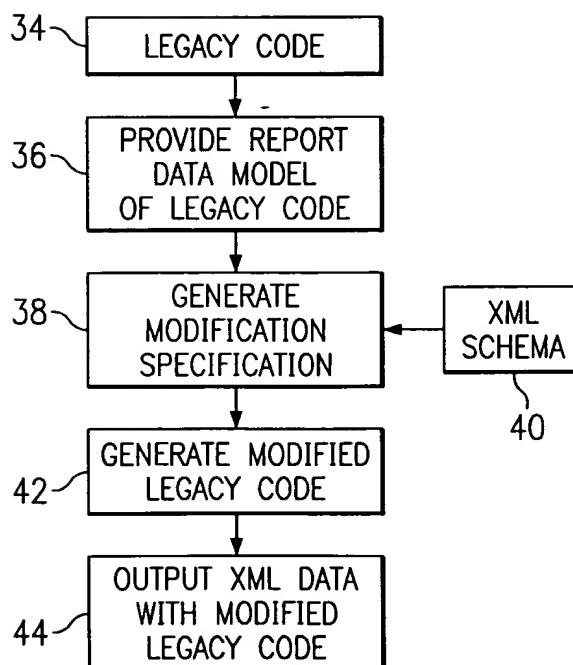


FIG. 2

FIG. 3

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Date 01/25/2000

American Telephone Company

Monthly Statement for Account Number: 1111111111
COMPANY: EDS

PHONE NUMBER: (214) 999-1212

PERSON: Suzie Q

Sample-Data

Date	Time	Rate	Number	City and State	Duration	Cost
12/01/1999	07:15A	B	210-404-6690	San Antoni TX	00:12.2	\$1.22
12/02/1999	01:00A	A	210-404-6690	San Antoni TX	00:01.0	\$.05
12/02/1999	17:45P	D	919-416-1212	Kill Devil NC	00:00.3	\$.06
12/03/1999	15:01P	C	210-404-6690	San Antoni TX	00:02.0	\$.30
12/03/1999	20:23P	D	919-462-1212	Kill Devil NC	03:02.3	\$36.46
12/04/1999	06:06A	B	615-655-1122	Nashville TN	00:00.5	\$.05
12/07/1999	04:00A	A	210-404-6690	San Antoni TX	01:00.0	\$3.00
12/07/1999	15:05P	C	615-655-1122	Nashville TN	00:40.5	\$6.07
12/07/1999	15:45P	C	205-555-1234	Dothan AL	00:04.3	\$.64
12/11/1999	02:13A	A	615-655-1122	Nashville TN	00:30.0	\$1.50
12/11/1999	08:08A	B	210-404-6690	San Antoni TX	02:20.5	\$14.05
12/13/1999	08:00A	B	210-404-6690	San Antoni TX	01:50.0	\$11.00
12/21/1999	00:26A	A	210-404-6690	San Antoni TX	00:31.3	\$1.56
12/21/1999	04:12A	A	919-416-1212	Kill Devil NC	00:32.0	\$1.60
12/21/1999	18:23P	D	615-655-1122	Nashville TN	00:23.3	\$4.67
12/21/1999	19:01P	D	210-404-6690	San Antoni TX	03:02.4	\$36.48
12/22/1999	08:04A	B	205-555-1234	Dothan AL	00:43.2	\$4.32
12/27/1999	12:01A	C	205-555-1234	Dothan AL	00:13.6	\$2.04
12/27/1999	21:12P	D	205-555-1234	Dothan AL	01:03.0	\$12.60

TOTAL CALLS: 19

TOTAL TIME: 16:12:49 \$137.67

FIG. 4

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```
<bill>
  <account>1111111111</account>
  <customer-name>EDS</customer-name>
  <calling-date>1/billing-date26/2000</>
  <total-bill-by-phone>69.66</total-bill-by-phone>
  <total-time-by-phone>515.6</total-time-by-phone>
  <total-calls>34</total-calls>
  <detail-list>
    <detail-by-phone>
      <phone-number>999-1212</phone-number>
      <area-code>214</area-code>
      <phone-user>Suzie Q Sample-Data</phone-user>
      <calls-by-phone>
        <call>
          <date>12-01-1999</date>
          <time>07.15A</time>
          <code>B</code>
          <phone-number>404-6690</phone-number>
          <area-code>210</area-code>
          <called-city>San Antonio</called-city>
          <called-state>TX</called-state>
          <duration>12.2</duration>
          <charge>1.22</charge>
        </call>
        <call>
          <date>12-01-1999</date>
          <time>01.00A</time>
          <code>A</code>
          <phone-number>404-6690</phone-number>
          <area-code>210</area-code>
          <called-city>San Antonio</called-city>
          <called-state>TX</called-state>
          <duration>01.0</duration>
          <charge>0.05</charge>
        </call>
        <call>
          <date>12-01-1999</date>
          <time>17.45P</time>
          <code>D</code>
          <phone-number>416-1212</phone-number>
          <area-code>919</area-code>
          <called-city>Kill Devil</called-city>
          <called-state>NC</called-state>
          <duration>0.3</duration>
          <charge>0.06</charge>
        </call>
      </calls-by-phone>
      ...
    </detail-by-phone>
    ...
  </detail-list>
</bill>
```

FIG. 5

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```
<Schema xmlns="urn: schemas-microsoft-com:xml-data"
  xmlns:dt="urn:schemas-microsoft-com:datatypes">
  <ElementType name="accountno" content="textonly"/>
  <ElementType name="customer-name" content="textonly"/>
  <ElementType name="billing-date" content="textonly"/>
  <ElementType name="total-cost" content="textonly"/>
  <ElementType name="total-number-calls" content="textonly"/>
  <ElementType name="total-time" content="textonly"/>
  <ElementType name="phone-number" content="textonly"/>
  <ElementType name="phone-user" content="textonly"/>
  <ElementType name="date" content="textonly"/>
  <ElementType name="charge" content="textonly"/>
  <ElementType name="called-city" content="textonly"/>
  <ElementType name="called-state" content="textonly"/>
  <ElementType name="duration" content="textonly"/>
  <ElementType name="code" content="textonly"/>
  <ElementType name="area-code" content="textonly"/>
  <ElementType name="time" content="textonly"/>
  <ElementType name="call">
    <element type="area-code" maxOccurs="1" />
    <element type="phone-number" maxOccurs="1" />
    <element type="code" maxOccurs="1" />
    <element type="date" maxOccurs="1" />
    <element type="time" maxOccurs="1" />
    <element type="duration" maxOccurs="1" />
    <element type="charge" maxOccurs="1" />
    <element type="called-city" maxOccurs="1" />
    <element type="called-state" maxOccurs="1" />
  </ElementType>
  <ElementType name="total-bill-by-phone" content="textonly"/>
  <ElementType name="total-time-by-phone" content="textonly"/>
  <ElementType name="total-calls-by-phone" content="textonly"/>
  <ElementType name="calls-by-phone">
    <ElementType name="call"/>
  </ElementType>
  <ElementType name="detail-by-phone">
    <element type="phone-number"/>
    <element type="area-code"/>
    <element type="phone-user"/>
    <element type="total-bill-by-phone"/>
    <element type="total-time-by-phone"/>
    <element type="total-calls-by-phone"/>
    <element type="calls-by-phone"/>
  </ElementType>
  <ElementType name="detail-list">
    <element type="detail-by-phone"/>
  </ElementType>
  <ElementType name="bill">
    <element type="accountno"/>
    <element type="customer-name"/>
    <element type="billing-date"/>
    <element type="total-cost"/>
    <element type="total-number-calls"/>
    <element type="total-time"/>
    <element type="detail-list"/>
  </ElementType>
</Schema>
```

FIG. 5A

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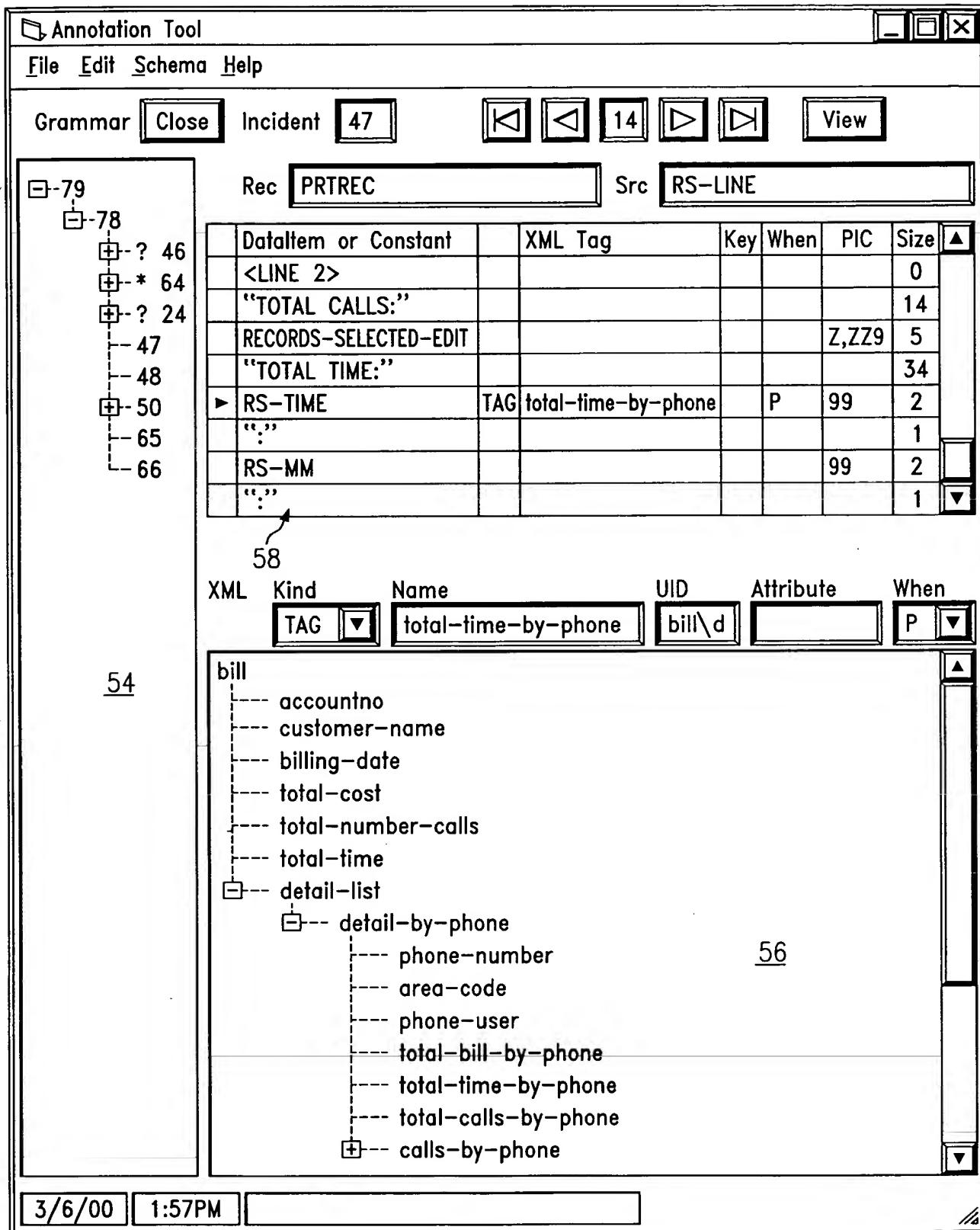


FIG. 6

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Source File Viewer

D:\xml-annotation\XML Annotator\Sample Data\cobol\phonebill.cbl

Close

Find Text1 520

```
56900 *
57000 *****
57100 *          SORT      *
57200 *****
57300 *BUILD-SORT-TEMP-FILE.
57400 * BUILD TEMPFILE HERE.
57500 *
57600 *****
57700 *          TERMINATION   *
57800 *****
57900 TERMINATION.
58000 PERFORM PRINT-A-CONTROL-BREAK-2.           94188JHA
58100 MOVE RECORDS-SELECTED-TOTAL TO RECORDS-SELECTED-EDIT. 94190JHA
58200 ADD 1           TO PAGE-COUNT.
58300 MOVE PAGE-COUNT      TO REPORT-PAGE-NO.
58400 WRITE PRTREC FROM R1-TITLE AFTER ADVANCING PAGE.    00003JHA
58500 MOVE "GRAND TOTAL:"    TO RS-MSG.
58600 MOVE GT-DURATION      TO HOLD-DURATION.
58700 PERFORM ACCUM-DURATION.
58800 MOVE WS-HH           TO RS-HH
58900 MOVE WS-MM           TO RS-MM.
59000 MOVE WS-SS           TO RS-SS.
59100 MOVE GT-COST          TO RS-COST.
59200 WRITE PRTREC FROM RS-LINE AFTER ADVANCING 5 LINES.
59300 CLOSE TEMPFILE.
59400 CLOSE PRINT.
59500 *
59600 *****
59700 *          DURATION COMPUTATION AREA      94190JHA
* 94190JHA
```

FIG. 6A

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```
<Schema xmlns="urn:schemas-microsoft-com:xml-data"
    xmlns:dt="urn:schemas-microsoft-com:datatypes">
    <AttributeType name="Current" content="boolean"/>
    <ElementType name="Name" content="textonly"/>
    <ElementType name="ID" content="textonly"/>
    <ElementType name="Street" content="textonly"/>
    <ElementType name="City" content="textonly"/>
    <ElementType name="State" content="textonly"/>
    <ElementType name="ZIP" content="textonly"/>
    <ElementType name="Address">
        <Attribute type="Current"/>
        <Element type="Street"/>
        <Element type="City"/>
        <Element type="State"/>
        <Element type="ZIP"/>
    </ElementType>
    <ElementType name="Customer">
        <Element type="Name"/>
        <Element type="Address"/>
        <Element type="ID"/>
    </ElementType>
</Schema>
```

FIG. 7

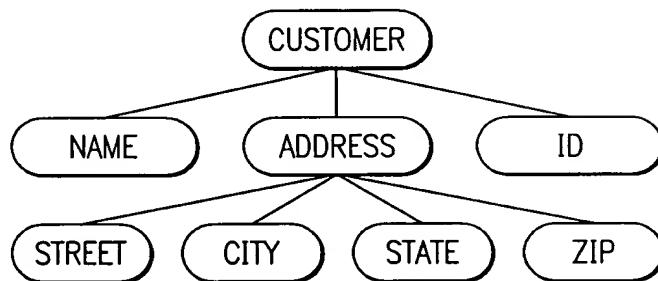


FIG. 7A

ID	LABEL	END LABEL	DEPTH	PARENT	CARDINALITY
1	<Customer>	</Customer>	1	0	n
2	<Name>	</Name>	2	1	1
3	<Address>	</Address>	2	1	1
4	<ID>	</ID>	2	1	1
5	<Street>	</Street>	3	3	1
6	<City>	</City>	3	3	1
7	<State>	</State>	3	3	1
8	<ZIP>	</ZIP>	3	3	1

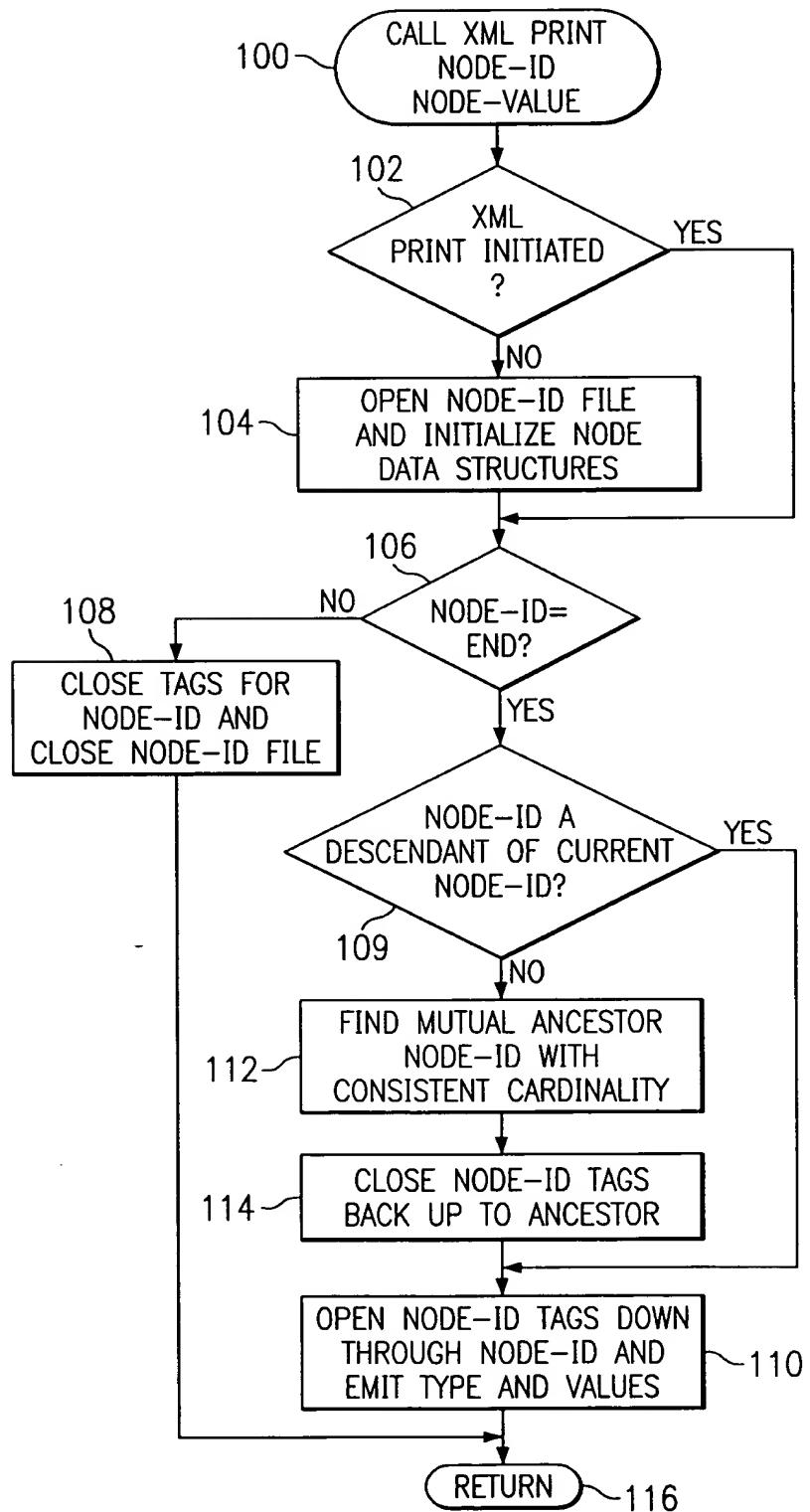
FIG. 7B

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FIG. 8



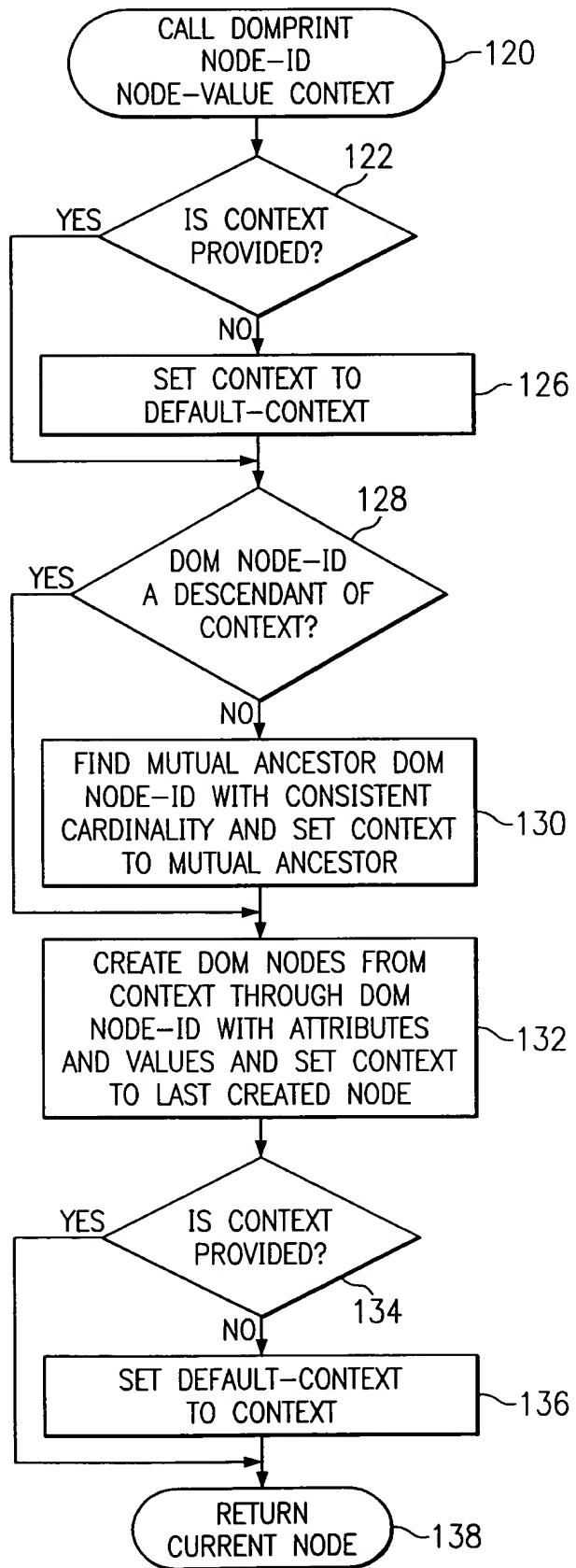
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FIG. 9



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